DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-003434
Date Inspected: 03-Aug-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 630
OSM Departure Time: 1730
Location: Shanghai, China

CWI Name: See below

Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**CWI Present:**	☑ Yes	☐ No	
Electrode to specification:	☑ Yes	☐ No	☐ N/A	**Rod Oven in Use:**	☑ Yes	☐ No	☐ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☑ Yes	☐ No	☐ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☐ Yes	☑ No	☐ N/A
				Approved WPS:	☑ Yes	☐ No	☐ N/A
				Delayed / Cancelled:	☐ Yes	☑ No	☐ N/A

Bridge No: 34-0006
Component: OBG/Tower

Summary of Items Observed:

OBG Sub Assembly Bay 1

Bay 1 Deck Panel

QA Inspector Brannon randomly observed ZPMC welding utilizing the dual process WPS-B-T-2342-U1 (U-rib)-3 welding procedure specification for closed rib welding for Production Panel DP547-002, DP547-002 and DP606-001 on closed U-rib Partial Joint Penetration (PJP) welds in Bay #1. ZPMC welding personnel performed Gantry Machine, Gas Metal Arc Welding (GMAW) for the root pass and immediately performed Gantry Machine, Submerged Arc Welding (SAW) for the cover/final, using gantry machine #2. QA Inspector Brannon observed the ZPMC QC CWI Inspector Chen Xi verifying that the welding parameters were in accordance with the above Welding Procedure Specification (WPS).

OBG/Tower Sub Assembly Bay 2

QA Inspector Brannon randomly observed that the 114 Meter Mock-Up to be idle on this date. QA Inspector Brannon observed no CNC torch cutting various tower web and OBG stiffener plates. QA Inspector Brannon observed ZPMC beveling various tower web plates using the horizontal milling machine.

OBG Sub Assembly Bay 3

QA Inspector Brannon randomly observed ZPMC continuing with the fabrication of various Side, Bottom and Edge Panels designated for the SAS OBG. The general fabrication of said items consist of removing of coating from weld joint areas, cutting stiffener plates, beveling various, splicing of plates, fitting, tack welding and welding.

Bay 3-OBG side/bottom/edge panels:
QA Inspector Brannon randomly observed ZPMC qualified welder's, tack welding various T stiffeners plates utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508 non-FCM and filler metal brand E7018, class THJ506Fe-1 for FCM material . Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112 and WPS-B-P-2112-FCM respectively.

Bay 3 –Side Panel stiffener fillet:
QA Inspector Brannon randomly observed ZPMC qualified welder fillet welding SP790-001 weld joint 029 & 030. Qualified welder was observed welding in the 2F (horizontal) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand Supercored 71H, class E71T-1. QA Inspector Brannon observed the ZPMC QC CWI Inspector Chen Chih Chien verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2112-3.

OBG side panels fillet weld cracks:
QA Inspector Brannon was informed by ZPMC QC of 4 fillet welds that had a total of 9 transverse cracks and SP403-001 weld joints 032, 035, 038 and 041. ZPMC technician Bo Ting Ruz performed magnetic particle testing MT on the fillet and found that the weld had transverse cracks. ZPMC QC Chen Chih Chien stated that ZPMC would be submitting an CWR report QA Inspector informed Task Leader Jimmy Cochran.

Bay 3 –Deck Panel stiffener splice:
QA Inspector Brannon randomly observed ZPMC qualified welders splice welding DP637-001 weld joint 020 & 021, DP625-001 weld joint 020 & 021, DP635-001 weld joint 020 & 021 and DP623-001 weld joint 020 & 021. Welders was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4. 8mm diameter electrode, filler metal class LA-85 machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Chen Chih Chien verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 3 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom/edge panels. Side/bottom/edge panels cause for heat straightening welding distortion. Heat Straightening is performed by flame straightening using oxygen acetylene or natural gas using a hand torch.

Bay 3-OBG side/bottom panel (Gantry 1 & 2):
QA Inspector Brannon randomly observed ZPMC qualified welders fillet welding joining T-stiffeners to side panel plate for BP311-001 weld joints 012~024 and BP310-001 weld joints 012~024 Gantry #1 and BP312-001 weld joints 010~021 Gantry #2 . Qualified welders was observed welding in the 2F (horizontal) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand Supercored 71H, class E71T-1. QA Inspector Brannon observed the ZPMC QC CWI Inspector Huang Wen Pang verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2132-3.

OBG/Tower Sub Assembly Bay 4
Bay 4 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom panels. Side/bottom panels cause for heat straightening welding distortion. Heat Straightening is performed by flame straightening using oxygen acetylene or natural gas using a hand torch.

Bay 4 Tower Diaphragm Flange Sub-assemblies:
QA Inspector Brannon randomly observed ZPMC welder's welding fill pass at weld joint # ESD1 SA318 weld joint 9B and SSD1 SA91 weld joints 5A & 9A. Qualified welders was observed welding in the 3G (vertical) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand Supercored 71H, class E71T-1. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Ye Yong Jun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2233-B-U3-F.

Bay 4 -Tower Double Diaphragm:
QA Inspector Brannon randomly observed ZPMC qualified welder tack welding at ESD1-SA234 weld joint 6. Qualified welder was observed welding in the 4G (overhead) position utilizing shielded metal arc welding (SMAW) process with a 4.8mm diameter electrode, filler metal brand Excalibur 9018M MR, class E9018M manual. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Ye Yong Jun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-33(1)14.

Bay 4 -Tower Double Diaphragm:
QA Inspector Brannon randomly observed ZPMC qualified welders welding root pass at ESD1-SA238 weld joint 11 & 12. Qualified welders was observed welding in the 4G (overhead) position utilizing shielded metal arc welding (SMAW) process with a 4.8mm diameter electrode, filler metal brand Excalibur 9018M MR, class E9018M manual. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Ye Yong Jun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3312-Tc-P5.

OBG/Tower Sub-Assembly
Bay 7-OBG floor beam panels:
QA Inspector Brannon randomly observed ZPMC qualified welder's, tack welding various floor beam web splice connections and floor beam top and bottom diaphragm flange to web utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508 or brand E7018, class ThJ506Fe1. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112 or WPS-B-P-2112-FCM.

Bay 7-OBG - Floor Beam Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder's fillet welding various floor beam stiffeners

plates to floor beam web plates. Qualified welders was observed welding in the 2F (horizontal) position utilizing a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2132-3.

Bay 7 OBG Floor Beam Sub Assemblies
QA Inspector Brannon randomly observed ZPMC qualified welder groove welding fill/cover passes for various floor beam web splice. Qualified welder was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal class EH14, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-L2c-S-2.

Bay 7-OBG – Longitudinal Diaphragm:
QA Inspector Brannon randomly observed ZPMC qualified welder fillet welding various longitudinal diaphragm stiffeners plates to longitudinal diaphragm plate. Qualified welder was observed welding in the 2F (horizontal) position utilizing a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2132-3.

OBG/Tower Sub-Assembly
Bay 8 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various tower diaphragm flange plates. Cause for heat straightening welding distortion. Heat Straightening is performed by flame straightening using natural gas with a hand torch.

Bay 8 OBG Floor Beam Sub Assemblies
QA Inspector Brannon randomly observed ZPMC qualified welder groove welding fill/cover passes for various floor beam web splice. Qualified welder was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-L2c-S-1.

Bay 8 Tower Diaphragm Flange Sub Assemblies:
QA Inspector Brannon randomly observed ZPMC welders welding fill pass's at weld joint # WSD1 SA290 8A, NSD1 SA169 7A and WSD1 SA370 3A. Welders was observed welding in the 3G (vertical) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand Supercored 71H, class E71T-1. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Sha Zhi verifying that the

welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2233-B-U3-F.

Bay 8 -Tower Double Diaphragm:
QA Inspector Brannon randomly observed ZPMC qualified welders welding root pass at ESD1-SA32 weld joints 3 & 4. Qualified welders was observed welding in the 4G (overhead) position utilizing shielded metal arc welding (SMAW) process with a 4.8mm diameter electrode, filler metal brand Excalibur 9018M MR, class E9018M manual. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Sha Zhi verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3312-Tc-P5.

Bay 48Tower Diaphragm Flange Sub-Assembly to Tower Diaphragm:
QA Inspector Brannon randomly observed ZPMC welder tack welding joining ESD1 SA316 weld joint #2. Welder was observed welding in the 2F (horizontal) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-12JH4, class K-71TSR. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Ye Yong Jun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-4132.

Summary of Conversations:
No relevant conversations to report.

Comments
This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Ady Velasco 13816942685, who represents the Office of Structural Materials for your project.

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
Reviewed By:	Lanz,Joe	QA Reviewer